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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/052,886	01/18/2002	Seemant Choudhary	064731.0263	1721

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EXAMINER	
BELLO, AGUSTIN	
ART UNIT	PAPER NUMBER
2613	

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	02/22/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 02/22/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/052,886	CHOUDHARY ET AL.	
	Examiner	Art Unit	
	Agustin Bello	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53* is/are pending in the application.

4a) Of the above claim(s) *1-11,20-36,51 and 53* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12, 14-19,37, 39-50 and 52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 1-11, 20-36, 51, and 53-53 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 8/11/05.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 12 and 15-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Noe et al in the article "Comparison of Polarization Handling Methods in Coherent Optical Systems."

Regarding claim 12, Noe teaches generating a polarized local signal based on receiver-side feedback ("LO" in Figure 9); combining an ingress traffic signal with the polarized local signal to generate a combined signal ("PMC" in Figure 9); wherein the ingress traffic signal is compensated for polarization mode dispersion (see Figures 10-13; inherent in a polarization diversity receiver), splitting the combined signal into a first split signal and second split signal ("PBS" in Figure 9); detecting the first split signal (upper "FE" in Figure 9); and detecting the second split signal (lower "FE" in claim 9). Noe differs from the claimed invention in that Noe fails to specifically teach that polarized local light signal is

Regarding claim 15, Noe teaches that the first split signal comprises a first component of the received signal (inherent in the use of the PBS of Figure 9).

Regarding claim 16, Noe teaches that the second split signal comprises a second component of the received signal (inherent in the use of the PBS in Figure 9).

Regarding claim 17, Noe teaches that the ingress traffic is optical (inherent).

Regarding claim 18, Noe teaches that the combined signal is split by a polarization beam splitter ("PBS" in Figure 9).

Regarding claim 19, Noe inherently teaches that the polarization of a first component of the ingress traffic signal is aligned to an axis of the polarization beam splitter (inherent in that separation takes place at the PBS in Figure 9).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 14, 37, 39-50, and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noe et al in the article "Comparison of Polarization Handling Methods in Coherent Optical Systems" in view of Brain et al in the article "Progress Towards the Field Deployment of Coherent Optical Fiber Systems."

Regarding claim 37, Noe teaches a means for receiving a signal, wherein the ingress traffic signal is compensated for polarization mode dispersion (see Figures 10-13, inherent in polarization diversity receivers).; a means for providing a local signal; a means for combining the polarized local signal and received signal; a means for splitting the combined signal into a first split signal and a second split signal; a means for detecting the first split signal; a means

for detecting the second split signal; and a means for generating feedback to modify the local signal (Figure 9 of Noe). Noe differs from the claimed invention in that Noe fails to specifically teach a means for controlling a polarization of the local signal to generate an appropriately polarized local signal. However, Brain, in the same field of optical communication, teaches that a means for controlling a polarization of the local signal to generate an appropriately polarized local signal is well known in the art (Figure 1). One skilled in the art would have been motivated to employ a means for controlling a polarization of the local signal to generate an appropriately polarized local signal in order to maximize the IF signal at the output of the receiver (Brain page 425 right column, first paragraph). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ a means for controlling a polarization of the local signal to generate an appropriately polarized local signal.

Regarding claim 39, the combination of references and Brain in particular teaches that the signal is received by an automatic polarization controller (as seen in Figure 1 of Brain).

Regarding claim 14, 40, 45, Noe differs from the claimed invention in that Noe fails to specifically teach that the polarization is circular polarization. However, Brain teaches the ability to match the state of polarization of an incoming optical signal via the use of an automated polarization control system for controlling the polarization of a local light source (Figure 1). Brain's automated polarization control system clearly includes the ability to produce light having a circular polarization (e.g. "limitless range of polarization adjustment" of Brain page 425 right column, first paragraph). One skilled in the art would have been motivated to produce circular polarization with the light source of Noe in order to maximize the output of the IF signal at the output of the receivers (Brain page 425 right column, first paragraph).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to produce circular polarization via the polarization controller taught by Brain in the device of Noe.

Regarding claim 41, Noe teaches that the first split signal comprises a first component of the received signal (inherent in Figure 9).

Regarding claim 42, Noe teaches that the second split signal comprises a second component of the received signal (inherent in Figure 9).

Regarding claims 43, Noe teaches that the ingress traffic is optical (inherent).

Regarding claim 44, the combination of references and Brain in particular teaches that a continuous wave laser provides the local signal (Brain page 425 left column, first paragraph).

Regarding claim 46, the combination of Noe and Brain differs from the claimed invention in that Noe fails to specifically teach that a quarter-wave plate controls the polarization of the system. However, the use of quarter-wave plates to control polarization is well known in the art. One skilled in the art would have been motivated to use a quarter-wave plate control the polarization of the system since they are readily available and relatively inexpensive. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ a quarter-wave plate as the polarization controllers of the system of Noe and Brain.

Regarding claims 47-48, the combination of Noe and Brain differs from the claimed invention in that Noe fails to specifically teach that the combiner is a half-mirror or a 3dB splitter. However, both types of combiners are well known in the art and readily available. One skilled in the art would have been motivated to employ wither one in order to meet a design requirement or to use what was available at the time. Therefore, it would have been obvious to

one skilled in the art at the time the invention was made to employ either a half-mirror or a 3dB splitter in the system of Noe.

Regarding claim 49, Noe inherently teaches that the polarization of a first component of the ingress traffic signal is aligned to an axis of the polarization beam splitter (inherent in that separation takes place at the PBS in Figure 9).

Regarding claim 50, Noe inherently teaches that the detecting means is a photodiode (inherent in the detection of optical signals).

Claim 52 recites a combination of individually rejected elements and is therefore rejected on the same grounds as stated above.

Response to Arguments

6. Applicant's arguments filed 11/15/06 with respect to the pending claims have been fully considered but they are not persuasive. The applicant argues that Noe fails to teach that the ingress traffic signal is compensated for polarization mode dispersion. However, as noted in the previous office action and reiterated above, the examiner believes this limitation to be inherent in the polarization diversity receiver of Noe. To support this determination, the examiner notes that polarization mode dispersion results from birefringence in a fiber path which causes individual spectral components of a received optical signal to have different polarization states, thereby resulting in a performance penalty in the form of an increased bit error rate (BER). Being that cohenrent detection systems are sensitive to polarization, one way of mitigating this polarization mode dispersion at a coherent receiver is by trying to match the polarization of the local oscillator with the polarization of the received optical signal. One method of doing so is via a polarization diversity receiver such as that taught by Noe. In Figure 11, Noe clearly shows the

resultant reduction in BER when the polarization of the local oscillator is matched, via a polarization diversity technique, with the polarization of the incoming optical signal. Therefore, the polarization diversity receiver, in matching the polarization of the local oscillator with the polarization of the incoming optical signal, results in a lower BER by compensating for polarization mode dispersion.

7. Applicant's arguments filed 8/11/06 with respect to claims 12-13 and 15-19 have been fully considered but they are not persuasive. Regarding claim 12, the applicant argues that Noe fails to specifically teach, "generating a polarized local light signal based on receiver-side feedback." However, the examiner disagrees. While the applicant's argument implies that the polarization of the local light signal is controlled via the receiver-side feed back, the claim language fails to positively recite this limitation. At best, the claim requires a local light source producing a polarized light signal where the polarized light source, and not necessarily the polarization of the light output by the local light source, is somehow controlled by receiver-side feed back. Given this interpretation of the claim language, the examiner notes that Noe teaches a polarized local light source producing polarized light that has its frequency controlled via receiver-side feedback. As such, when given the broadest reasonable interpretation, Noe teaches generating a polarized local light signal based on receiver-side feedback in that a polarized local light signal is produced where the frequency of local light signal is controlled based on receiver-side feedback.

Next, the applicant argues that the ingress traffic is compensated for polarization mode dispersion. However, as noted in the office action, Figures 10-13 clearly show this to be the case.

8. Applicant's arguments with respect to claims 14 and 37-50 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Agustin Bello
Primary Examiner
Art Unit 2613

AB